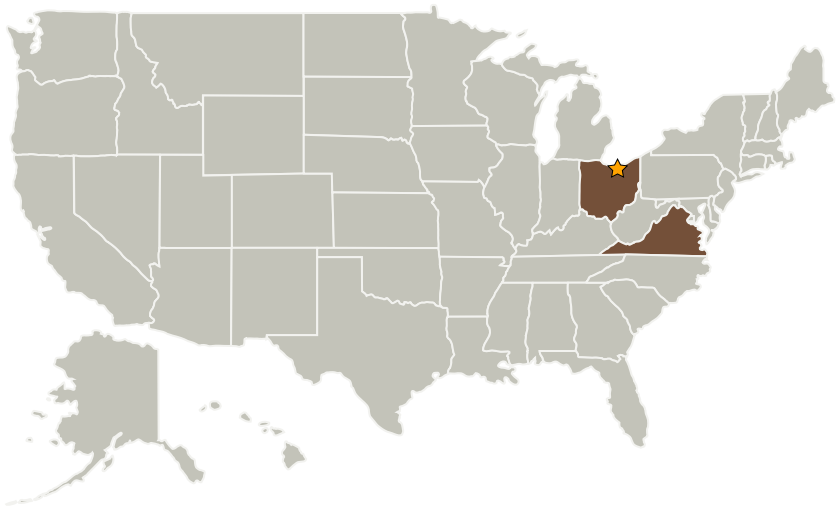
Versatile Fiber Optic 6-Component Force Measurement System, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

The mission of NASA's ATP is to maintain and advance the testing capabilities of the United States' extensive infrastructure of aerospace research facilities. One key component to these ground based test facilities are the force balances used to measure aerodynamic loads on models undergoing characterization and testing. NASA currently maintains an inventory of balances that were designed for previous models and operating ranges that may not be as relevant to current test conditions. Project resources do not always allow a balance to be designed for specific testing applications due to the associated costs and schedule. Luna Innovations is proposing to develop new and innovative force balance technology that will reduce the cost of facility instrumentation and allow for reduced design and instrumentation time, while providing more accurate and reliable results when compared to current balances. This development utilizes proven fiber optic sensor technology that integrates active thermal compensation with a miniaturized, highly accurate, multi-channel sensing network. The versatile operating range of this technology with respect to temperatures and loading conditions, combined with a high channel count data processing system designed by Luna, will provide advanced measurement capabilities for NASA facilities and enable accurate testing of emerging propulsion and transport technologies.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Luna Innovations, Inc.	Supporting Organization	Industry	Roanoke, Virginia

Primary U.S. Work Locations	
Ohio	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors